Communications of the Association for Information Systems

Volume 22 Article 23

4-2008

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Recommended Citation
Sims, Julian; Vidgen, Richard; and Powell, Philip (2008) "E-Learning and the Digital Divide: Perpetuating Cultural and Socio-Economic Elitism in Higher Education," *Communications of the Association for Information Systems*: Vol. 22 , Article 23.
DOI: 10.17705/1CAIS.02223
Available at: https://aisel.aisnet.org/cais/vol22/iss1/23

Communications of the Association for Information Systems

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E-Learning and the Digital Divide: Perpetuating Cultural and Socio-Economic Elitism in Higher Education

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Abstract:

Education is often seen as a route to full participation in society, and widening participation in education and lifelong learning as a way of including those who are currently excluded from many of the benefits of society. The use of learning technology (e-learning) is perceived by national governments, the European Union (EU), and academic institutions as a means of widening participation in higher education by enabling participation by nontraditional students. E-learning is perceived as lowering barriers of time and place to enable nontraditional students to attend campus-based education while accessing resources at a time and place of their choosing. Yet, there is dissonance between the espoused belief of governments the EU and academic institutions, in e-learning as a means of widening participation, and the reality of e-learning implementation. The digital divide refers to the gap between those who have access to the information technology, and those who do not. This research finds that the digital divide is not adequately addressed by higher education institutions, with some students financially unable to afford technology and broadband access, others lack the skills to engage with learning technology, and some are culturally less able to benefit from technological enrichment. It also finds gender and generational differences disenfranchising some students. In order to address this situation it will be necessary to first acknowledge that the problem exists.

Keywords: digital divide, learning technology, widening participation, cognitive dissonance

Volume 22, Article 23, pp. 429-442, April 2008

I. INTRODUCTION

E-learning is perceived as a means of widening participation in higher education (HE) by reducing time and place barriers, thus allowing students with caring and/or working responsibilities to access HE without having to attend campus-based study on a full-time basis. It is also perceived as making teaching and learning more accessible to less academic students by presenting content in an interactive format, and in a manner that allows students to "replay" content such as lectures over again as the student needs. This paper questions the assumption that these benefits do benefit the traditionally excluded population. There are two principal aspects to the criticism of e-learning presented in this paper: First, access to technology; Second, the appropriateness of e-learning as a means of including the traditionally excluded population. The access problem can itself be divided into two elements: Whether e-learning enables or bars technology "have-nots" from accessing HE and how present student populations cope with digital requirements. The question of appropriateness can be divided into three issues: 1) Does e-learning promote learning in isolation, thus excluding digital learners from the benefits of social learning? 2) Is traditional pedagogy merely plugged into digital teaching and learning without addressing the different pedagogical requirements of e-learning? 3) Is the traditional pedagogy appropriate for traditionally excluded populations? This paper addresses these points by analysing seven higher education institutions (HEIs) in the UK to investigate how they use e-learning. It finds a dissonance between espoused governmental and institutional goals, and governmental and institutional practice. The research concludes that without particular measures to overcome the digital divide, current practices in higher education can only reinforce socio-economic, cultural, ethnic, and gender divides in access to higher education. What is more, supplying ICT to low-income households with low-terminal education levels will not be sufficient. Social infrastructure, such as learning networks, communities of practice, and HEI outreach workers, are likely to be needed if e-learning is to be successful and widened participation achieved.

II. THE WIDENING PARTICIPATION ARGUMENT

Widening participation in education is seen by many as a means of including those who have hitherto been excluded from many of the benefits of modern society. "Education for all" is viewed as an imperative for world security, as an unconnected population suffering high unemployment leads to instability. Education, skills, ethics, and values lead to responsible citizens; an educated and competent people are the essential foundation for democratic societies and market economies [Daniel 1999].

One of the most obvious barriers to learning is cost [Godard et al. 2000], but there are others such as time, location of educational institutions, and cultural access to education. There is an untested perception that many of these barriers can be overcome by the use of learning technology that reduces time and place barriers allowing learners increasing access to learning materials and activities via virtual learning environments (VLEs) that they can access on campus networks in university computer facilities, in halls of residence via "res-nets," and at home via the Internet.

Lewin, Mavers, and Somekh [2003] suggest that technology plays a unique role as the unifying "big idea" that policymakers believe will deliver raised educational performance and at the same time open up opportunities for all in a more just and inclusive education system. The UK government believes lifelong learning will bring economic benefit and increase social inclusion [Godard et al. 2000], and the European Lifelong Learning Initiative (ELLI) espouses lifelong learning as a means to achieve human potential [Longworth 1999]. While distance learning represents one aspect of widening participation, the use of learning technologies in traditional face-to-face (F2F) teaching and learning is also important. While some universities use e-learning for distance education, most students in higher education attend traditional campus-based universities and participate in F2F learning which is increasingly being delivered in conjunction with online resources and activities over VLEs.

Many HEIs espouse an ethos of inclusion. In light of the importance of widening participation and lifelong learning, and the role that technology plays in including previously excluded populations, it is important that universities engage with learning technologies in such a way as to ensure access is available for nontraditional students from those sections of society that have been previously excluded. This research therefore asks three questions:

RQ1: Where traditional universities use learning technologies, are they being used with the intention of widening participation beyond those members of society who would traditionally attend university (nontraditional students)?

RQ2: Are efforts being made to make information and communication technology (ICT) available to nontraditional students?

RQ3: Are learning technologies being used with suitable pedagogy and e-learning context that make education accessible to potential nontraditional students?

This paper follows with a review of the literature on widening participation, learning technology, and cognitive dissonance; followed by the research proposition, the research design and methodology, ending with findings and analysis, and conclusions.

III. SOCIAL INCLUSION

Many members of society who do not participate in higher education are seen to be nonparticipants because of lack of financial resources, caring or work-related commitments that leave insufficient time to attend a traditional campus-based course of study, or for cultural reasons that leave the individual unwilling, or unmotivated to attend university. Traditionally nonparticipating groups in tertiary education are the young unemployed, and adult returners. Poorer groups defined by unemployment, low wage, occupational class, gender, area of residence, have low participation in learning, as do ex-offenders, part-time or temporary workers, those with low levels of basic skills, and some ethnic groups [Godard et al. 2000].

It is therefore a central tenet of widening participation in adult learning, and combating social exclusion, that the time and place barriers of access to learning should be lowered, and the belief that information and communications technology (ICT) will facilitate that [Godard et al. 2000]. ICT can minimise time and place constraints in adult education provided learners have access to, and the skills to use, modern technology [ETAG 1998], and there is a belief that learning technologies should be used to deliver learning for people wherever they want to receive it [Longworth 1999].

However, not all households in the Europe have access to the technologies required to participate in learning. The "digital divide" refers to the gap between those who have access to the new information technologies, the information "haves," and those who do not have access, the information "have-nots" [Clark 2003].

Internet access varies across the EU [European Commission 2005], Luxembourg and the UK have joined the Nordic countries and Netherlands in scoring an Internet access rate above 50 percent, while countries including Italy, Belgium, Austria, and Germany are positined around the EU average. Ireland, Spain, and France have a lower than average access rate of around 35 percent with Portugal and Greece lagging at 21 percent. The proportional increase in Internet access has been greater for unemployed and self-employed people compared with other occupation-related categories. The European Commission report [2005] concludes:

> However, in general terms, higher Internet use seems to remain clearly and consistently related to higher educational level and occupational status. Gender, age, and rural versus urban location are other important determinants of access to the cyberspace. (p. 9)

What is more, simple access to a computer in the home is no longer sufficient; in order to fully participate in higher education where learning technologies deliver resources via VLEs, access to the Internet is necessary, and because of increasing file size and the interactive nature of such technologically supported teaching and learning, bandwidth is critical to student time and cost. Thus the newest dimension of the digital divide is access to broadband Internet service [Prieger 2003]. Digital equity in education must mean that every student needs equal access to technology and the opportunity to be full participants in the digital age [Solomon et al. 2003].

The nature of the digital divide is changing over time. For example, a study from 2000 shows only one-third of households in Wales have access to computers at home, while only 13 percent have access to the Internet at home [Godard et al. 2000]. A more recent study of the use of learning technology in secondary education finds a significant minority of students' homes lack computers and internet links [Lewin et al. 2003]. Access to, and use of, the Internet at home is divided along socioeconomic lines [Computer-Weekly 2003], 52 percent of the UK population are regular Internet users, while the growth of use in low income groups is low. Of those regularly using the Internet in the UK, 82 percent are high earners, while only 10 percent are low earners. Access to the Internet is limited by a number of factors besides hardware and access to telecommunications service; for example many Web sites are not designed to be used with adaptive technologies such as audio screen readers and Braille keyboards leaving the visually impaired excluded from full participation.

While there may be many in society using ICT and the Internet, an important minority do not use it. For example, 17 million adults in the UK have not accessed the Internet in the last 12 months [Computer Weekly, 2003]. There are

many barriers to the adoption of ICT in the home, a U.S. study by Venkatesh [2001] cites three reasons for nonadoption: rapid change in technology (58 percent), high cost (38 percent), and requisite knowledge (40 percent). In a more recent study the European Commission [2005] points to some causes of digital exclusion:

> .. the non availability of a PC at home, combined with lack of access at work or at Public Access Points; the high cost of PC ownership and of Internet connection; the complexity of the technology and the lack of basic skills account for the main identified barriers: income and education-related factors emerge again as major determinants of digital exclusion. Almost 30 percent of the nonusers in the EU 25 do not want to go online, or are not interested in doing so. Lack of awareness, lack of time, language barriers, and unavailability of useful content are identified as other important obstacles to ICT use. (pp. 10-11)

A circular pattern of exclusion begins to emerge: income and education are the major determinants of digital exclusion, yet education and digital inclusion are determinants of higher levels of social inclusion and higher income. In households with low income and low-terminal education there will be low e-inclusion. In households with high-terminal education and high e-inclusion, there will be higher social inclusion and income.

The Venkatesh study shows that adopters were driven by the utilitarian outcomes, hedonic outcomes (i.e., fun), and social outcomes (i.e., status) from adoption. Nonadopters, on the other hand, were influenced primarily by rapid changes in technology and the consequent fear of obsolescence. Those not intending to adopt followed their intent more closely than those who did intend to adopt.

Cultural and gender differences are also important. Among Hispanic college students in the USA, there are statistically significant differences between males and females in their attitudes toward the use of the Internet and technology, with males generally more accepting in the use of technology than females [Slate et al. 2002]. Attitudes to the use of technology affect the choice of educational course. Females exhibit more anxiety in the use of technology and do not incorporate technology courses in their educational programs as much as males [Slate et al. 2002]. The use of technology by the adult returner female population is also problematic. Some authors view the amelioration of time and place boundaries from the use of ICT as a compromise for women who might otherwise have to choose between full-time activities such as education or working, and raising children [Duxbury et al. 1998, Foegen, 1984].

Godard, et al. [2000] find that the culture of ICT is generally young, white, middle class and male, not working class, older, female or ethnic minority. This leads to a view that in the short-to-medium term access to the Internet will be delineated along the lines of socioeconomic, gender, and ethnic group, and traditional patterns of exclusion will remain. There is a lack of skills and access to hardware which is stopping low-income groups from accessing the Internet, and the cost of equipment and access to the internet is unlikely to attract poorer groups. What is more, as access patterns and the technology required for access changes, those who are already excluded will be playing catch-up [Godard et al. 2000]. However, more recent evidence finds the gender gap is narrowing [2005] and is a temporary phenomenon, having been almost or completely overcome in newer EU member states such as Ireland.
The European Commission [2005] lay out three scenarios for the digital divide. The first scenario is that there is some delay between social groups but that these groups will catch up in the medium term, i.e., the digital divide is a temporary issue. In the second scenario there is considerable delay between social groups, and they will only catch up in the long or very long term. In the third scenario there is considerable delay between social groups and these groups will not catch up. Although gender and age may fall under scenario 1, suggesting that in the medium term these groups will catch up, the EC report highlights low income and less educated groups as being in danger of falling into scenario 2 or 3, suggesting long-term or very long-term exclusion, and conclude that effective public intervention is needed if Europe is to become “a more cohesive knowledge society” (p. 12). As such, social inclusion and e-inclusion are linked. This linkage points to a need to widen participation in education and the potential role for e-learning in enabling that widening of participation to those excluded groups. The Oxford Internet Survey (OIS) [Dutton and Helsper 2007] shows that in 2007 29% of households and 28% of individuals in the UK still do not have Internet access, they suggest that penetration is slowing, maybe even to a plateau. This is important as it suggests that it is not going away in the near future. OIS also suggests that education level and income continue to be key predictors of internet use, with half of respondents reporting that it is too expensive.

IV. E-LEARNING

Educational technology is not a neutral and value-free tool [Lewin et al. 2003]. Technology use is culturally located and certain kinds of use create cultural capital, translating into economic capital through career development and other opportunities, while others do not [Bourdieu 1977]. Thus, the advantages from the use of educational technology are restricted to those whose homes have high cultural capital [Lewin et al. 2003]. From an institutional perspective, the digital world is emergent, evolving, embedded, fragmented, and a provisional social production, shaped by cultural and structural forces as well as technical and economic ones [Orlikowski and Barley 2001].

Household choices, socioeconomic status and family structure affect educational opportunities [Lewin et al. 2003]. Barley and Tolbert [1997] state that "Organisations and the individuals who populate them are suspended in a web of values, norms, rules, beliefs, and taken-for-granted assumptions that are at least partially of their own making." Educational success may require parental support for participation, and a belief that education is important [Lewin et al. 2003] and many students who do not have access to the Internet outside of school never use it inside school [Somekh and Mavers 2001].

Although many students have no access to the Internet at home, university campuses and community libraries do have computing facilities. However, while ICT facilities are provided free at point of delivery in institutions such as libraries and university computing sites, the problems of opening times, transport and other barriers remain [Godard et al. 2000].

There are other issues to consider in the use of learning technologies. The use of technology in education may be inappropriate for conventional pedagogical approaches of information transfer and high stakes assessment [Lewin et al. 2003], and the social context of education is more important than the technology or the curriculum [Henning and Westhuizen 2004]. So even if ICT is used to reduce time and place barriers, students accessing resources from home, and limiting their presence on campus, will miss out on the benefits associated with face-to-face learning, and the learning in meaningful contexts espoused by Bruner [1960].

Technology may not be an answer to educational exclusion and the social exclusion it engenders. Many believe inequalities of access to technology may exaggerate traditional barriers to learning, thus the use of learning technology is likely to replicate inequalities in access to education [Godard et al. 2000], an argument similar to Bourdieu [1977] who suggests that technology may replicate and intensify existing discourses and practices. Thus technology is likely to increase disadvantage rather than reduce it because of inequality of access [Selwyn 1997] and the role of technology in widening participation may be less than advocates claim [Godard et al. 2000]. Lewin [2003] states that the UK government's approach to broadening access to education through the use of technology is highly problematic and since use is socioculturally constructed it leads to reproduction of inequalities between students whose homes have differing levels of cultural capital. Thus for some researchers the role of technology in effectively widening participation in adult learning remains largely untested [Godard et al. 2000].

If e-learning is promoted and funded by national and EU governments as a means of widening participation, then it would be reasonable to expect that e-learning is implemented in such a way as to promote a greater inclusion of previously excluded populations. If this is not so, it would suggest that there is dissonance between the espoused views of government and the reality of the implementation of e-learning. Cognitive dissonance exists where there is a lack of consistency between what a person, or for the purposes of this research an organisation, knows or believes, and what they do [Festinger 1959]. The existence of dissonance will motivate the organisation to try to reduce the dissonance and achieve consonance, either by avoiding situations or information that may increase the dissonance, or by changing their actions to bring them in line with the knowledge or beliefs their actions are at odds with. Following from Festinger's argument, it is to be expected that governments and HEIs will either be ensuring that e-learning is implemented in a way that widens participation in higher education, or avoiding the knowledge that it does not.

V. RESEARCH PROPOSITION

Low income and low-terminal education points to a need for e-learning to facilitate social inclusion, but this is the very situation where e-learning is least likely to be successful. If an individual is a member of a household with low terminal education level, they are probably not in a setting that is conducive to e-learning. Without careful implementation, e-learning may be implemented in such a way that those who benefit are those who are already e-included.

Widening participation through e-learning needs to overcome three barriers. First, the issue of lack of access to technology must be addressed. However, merely supplying the technology is insufficient. Thus, second, the lack of expertise in the use of technology by members of e-excluded households must be overcome if they are to participate in the information society. Third, and possibly most difficult, the lack of cultural capital in participation in higher education typical of members of households with low-terminal education and low income must be addressed if these members of society are to participate effectively in higher education. Therefore, the use of e-learning in widening participation must address these three barriers by: first, making technology available to e-excluded groups; second, ensuring that the skills to use that technology are available in such a way as to enable e-inclusion; third, to ensure that the pedagogy of e-learning is appropriate to excluded groups such that an effective social context for learning is created.

If widening participation in education to previously excluded members of society is a critical mission for the European Union, and ICT is to play a pivotal role in that mission, are universities using learning technology in such a way as to support that programme? In order to do so, universities must consider three elements to e-learning use. First, is the intention in the use of learning technology to widen participation to those members of society who have previously been excluded from participation in higher education? Second, are institutions making an effort to ensure that disadvantaged students are provided with the technology required to access online learning resources and activities, and virtual learning environments (VLEs)? However, merely supplying the technology is insufficient. Are universities training students in the use of technology? Third, is learning technology used with a suitable pedagogy and is an effective social context for learning created for nontraditional students? This research considers the role of universities in widening participation, and investigates what they have been doing with regard to this research agenda.

VI. RESEARCH DESIGN AND METHOD

To investigate these questions a multiple in-depth case study approach has been adopted, which is consistent with the focus of obtaining rich data in a natural setting [Yin 1994]. Data was gathered from multiple sources from within each case to provide mutual verification [Glaser and Strauss 1967]. The contemporary nature of this research, and the availability of the key actors in each case, as well as supporting documentation, meant that case study was an appropriate and practical choice of research method.

The unit of analysis for this research is a higher education institution (HEI). E-learning in universities is being adopted by many similar organisations across a relatively homogeneous group of institutions, which provides an opportunity to select cases based on relative performance and size to enable a wide representation of the higher education sector. This research is not looking for predictive power from a sample to a population, but rather, is seeking rich data to help understand the nature of e-learning and its role in widening participation. The research design is multiple case study where case organizations are chosen on the basis of high, low and mid-performing UK HEIs to provide a cross-section of institutions. HEIs in the UK can be divided into teaching-led and research-led institutions. Those that are teaching-led do not fare well in research rankings, but may be assumed to be more student-centred and thus more interested in widening participation.

Performance measurement is standardised in the UK by virtue of governmental funding policy, and published rankings of universities, used by students in choosing an HEI. While there may be some discussion, or dissent, about the appropriateness of such measures for funding decisions, or choice of university, research universities nevertheless strive to compete on the basis of research assessment exercise (RAE) ratings, and a limited number of published rankings for postgraduate courses. This provides an opportunity to identify case organisations operating at different levels of performance. Seven UK higher educational institutions were chosen for study (Table 1): two in the upper quartile of the national rankings, one mid, and two lower quartile cases, along with a distance-only institution, and an institute of higher education which does not have full university status. This offers a wide range of institutional type and performance level. Each case was a research and teaching institution to a greater or lesser extent, with both undergraduate, and taught and research postgraduate courses. All cases use learning technologies and all have, to a greater or lesser extent, programmes of study delivered at a distance. Although one is purely a distance learning institution, the remainder are traditional campus-based universities and a university college. Of the cases, there was one large and one small institution from the upper quartile of the rankings, three large institutions from the mid and lower quartile, and one small institute without university status. There were no small low-performing institutions available for study. Size was determined according to the descriptions given in the *Times* newspaper *Good University Guide* [2003].

The research was part of a larger study investigating competencies and capabilities in e-learning which used an interview framework in the form of a questionnaire designed to elicit responses identifying competencies and capabilities within organisations. Interviews were semi-structured, allowing freedom for discussion to develop. Principal actors in each case were identified and interviewed. Interviewees in all of the cases were users of learning technologies, or actors in a decision-making position within the organisation who were in a position to influence the organisation's use of learning technology. All interviewees were asked about the digital divide, unless they raised the issue themselves prior to an opportunity for the interviewer to pose a question on the subject. All interviewees discussed the use of learning technology in terms of what they perceived to be the most important elements of its use, and the implications of use. Documentation was gathered where available. Interviews were tape recorded, and the tapes transcribed. Transcriptions were then coded into individual statements or protocols that were interpreted by the researchers as falling into various themes, including the digital divide. The data were coded using NVivo, a qualitative analysis tool, to aid analysis.

Table 1. Selection of Cases					
Case	Size	Research	E-learning	Rankings	Distance/Local
1.	Large	Active	Active	Upper quartile	Distance not a focus/local use of learning technology through use of VLE
2.	Small	Active	Active	Upper quartile	Distance not a focus/local use of learning technology through use of VLE
3.	Large	Active	Active	Middle	Mainstream distance courses plus local use of learning technology through use of VLE
4.	Large	Less active	Active	Lower quartile	Delivers courses at a distance via partner organisations plus local use of learning technology through use of VLE
5.	Large	Active	Active	Not ranked	Solely distance learning
6.	Large	Less active	Active	Lower quartile	Distance not a focus/local use of learning technology through use of VLE
7.	Small	Active	Active	Not ranked	Distance not a focus/local use of learning technology through use of VLE

The interviewees are numbered, as are the cases. Each of the interviewees is described below (Table 1) by their roles within their institution. The numbering of the interviewees is not contiguous because the actual interviews did not follow the planned course of interviews, nor were all of the potential interviewees eventually interviewed.

Table 2. Interviewees		
Case	Interviewee	Position in institution
1	1	Research Director and Acting Institute Director for a teaching and learning support department responsible for supporting academics in the use of educational technology and e-learning
1	2	Manager of the teaching and learning support department, and Deputy Director of a Learning and Teaching Support Network (LTSN), a national online teaching and learning support network
1	3	Professor of education, an e-learning user, and a member of various high level university committees.
1	4	Professor of education and a Pro Vice-Chancellor
2	6	Learning technologist responsible for development of e-learning by supporting academic staff in the use of learning technology
2	7	Interviewee six's co-worker and also a learning technologist
2	8	Director of the learning technology support unit that interviewees 6 and 7 worked in; Member of various high level committees within the institution, but not a member of the senate
2	9	Director of a national information service, and a member of case 2 planning committees; Also with a technical role within the university computing services
2	10	Director of a different national information service, and also a member of case 2 planning committees
2	11	Dean of one of the faculties and Pro-Vice-Chancellor for Learning & Teaching
2	12	Lecturer, an e-learning user, and a manager of IT projects for one of the faculties
3	13	Lecturer using learning technology, and a head of department
3	14	Interviewee thirteen's co-worker and also a lecturer using e-learning
3	15	Lecturer using learning technology, both teaching with it, and teaching how to use it
4	16	Lecturer using learning technology, and creator of online content for a separate distance learning venture
4	17	Lecturer using e-learning, and managing a distance learning venture run separately from the conventional F2F courses
4	18	Lecturer using learning technology, a department head, and involved in institutional decision making

5	19	Lecturer and sub-dean responsibility for all course production and electronic media developments in one of the schools; Also chair of an e-learning committee, as well as being on other committees and convenor of a case 5 institution-wide e-learning group
5	20	Senior lecturer using e-learning, and a widely-published author writing about e-learning
5	21	Senior lecturer using learning technology in teaching about the use of e-learning, and involved in institutional decision making
5	22	Senior lecturer using e-learning
5	23	Lecturer using e-learning, and was well as author writing about e-learning and involved in institutional decision making
6	24	An associate head of department and lecturer using e-learning
6	25	Learning technologist supporting academic staff in the development of e-learning programmes
6	26	Lecturer using e-learning
6	27	Lecturer using e-learning
6	28	Senior research fellow developing e-learning programmes, and involved in the decision making of the institution
6	29	Senior manager involved in institutional decision making
7	30	Learning technologist supporting academic staff in the development of e-learning programmes, and involved in the mid-level decision making of the institution

Interviewee statements were sorted into themes that arose from the data. In some instances subjects made clear statements that were used to identify areas of importance, while other themes emerged from the data where subjects identified issues, processes and capabilities. Themes were supported by more than one subject, and where possible all were corroborated against several interviewees. For example, when interviewees were asked if there was a digital divide among their students, many subjects responded that they believed there was a problem and that not all of their students had computers at home. This was taken as evidence that not all students had equal access to learning technologies. This proposition was then triangulated against statements that identified that learning programmes were delivered (at least in part) using technologies such as VLEs, which suggests that there is evidence of inequality in educational access.

VII. FINDINGS AND ANALYSIS

This section presents the findings from the research. Statements from interviewees are used to develop responses to the research questions. Each statement is coded by case number: e.g. C1 for case one; respondent or interviewee number: e.g. R1 for respondent or interviewee one; and by statement number: e.g. S1 for statement one, or S1-9 for statements one through nine.

Intention of Widening Participation

Research question 1 asks: Where traditional universities use learning technologies, are they being used with the intention of widening participation beyond those members of society who would traditionally attend university?
Institutional intent is difficult to determine. It might be argued that intent resides with senior managers within an institution, or where decision-making is distributed or decentralised, intent may reside at different levels within the institution. This paper argues that because many HEIs are characterised as having decentralised decision-making due to a high degree of autonomy for academic staff [Sims et al. 2004b], intent for such institutions resides with those who make the decision to implement e-learning, the academic staff designing and implementing e-learning in their teaching and learning. For the remaining institutions intent may indeed reside with senior managers.

The data provides evidence of intent of widening participation in the form of statements from interviewees in cases 2, 5, 6 and 7.

The evidence contains one set of statements that refer to less academically able students with modest school level performance (A levels) who "quite like to have things up in an e-learning format, because [they can go over it] over and over again at their own pace" *(C2R12S18)*. In another set of statements an interviewee talks about how the institution is "busy wrestling with all of those problems about widening participation, increasing participation and reducing drop-out" *(C5R20S250 - 257)* and the perception that "the obvious" might be that "e-learning ... can encourage widening participation" *(C5R20S250 - 257)*, but the interviewee is not convinced of the argument, and there is a "big debate going on about that in the university" *(C5R20S250 - 257)*.

Another interviewee describes students who are working while studying and suggests that e-learning "complements the need of students to not be on-campus" *(C6R24S160)* so that they can "actually maybe work a shift from ... six till

twelve and then ... manage their learning at different times" *(C6R24S160)*. Other interviewees support this idea, they talk about their students being nontraditional students and having "multiple roles"*(C6R27S170)* as employees, students, parents, caring for aged parents, and identifies a need to "offer them some kind of virtual campus experience without them having to actually be here" *(C6R27S170)*. They provide an example: "Maybe they get up at six in the morning because their toddler wakes at seven and going online for an hour then, I asked one student you know, You happened to be logging on at 2 o'clock yesterday morning," "He is a bouncer [at] a nightclub, comes back and his kind of ooh wide-awake so [it's his] hour then." *(C6R27S171)* They go on to explain that e-learning is eroding time and place constraints."

One of the interviewees provides an example of using e-learning to engage students who normally did not participate. They describe how students engaged with e-learning materials set up as a game, and how not only did they actively engage with the materials, "When we did the Web analysis, not only had they gone through and [done] all tasks, and played a game, and gone to the high scoreboard, in the next week in their own time they'd gone back" *(C6R27S51)*.

There is also evidence of non-intent to implement e-learning to help in widening participation. This can be indicated where the intent is to achieve some other purpose, and where widening participation is not one of the intended outcomes. It can also be argued that where there is no institutional strategy for e-learning implementation, and where those individuals within the institution who are making decisions about how and why e-learning is implemented do not consider widening participation to be a factor in their decision-making, then this is evidence of non-intent to implement e-learning to help in widening participation. The following paragraph first lays out evidence that for some institutions there is no institutional strategy for e-learning implementation and then identifies intent to achieve some other purpose.

The interviewer asks interviewee 2 at case 1, "Is there an over-arching view of what e-learning is, where it is going?" To which the interviewee answers categorically, "No," and continues, "as I'm sure other people have already told you" *(C1R2S203-204)*. This interviewee is manager of the teaching and learning support department, and a deputy director of a Learning and Teaching Support Network (LTSN). Interviewees at case 2 also indicate that the institution has no strategy, interviewee 11, a dean of one of the faculties and Pro-Vice-Chancellor for Learning & Teaching, even went so far as to say, "The strategy was not to have a corporate strategy, the strategy was to … let these things go" *(C2R12S58)*. Interviewees in case 3 talked about both top-down strategy in some parts on the institution, and bottom-up approach in other parts. However, where there was a strategy it was not about widening participation, nor was it where there was bottom-up decision making. The drivers were, according to interviewees, either money or pedagogy, as one interviewee states that there are "people who are interested in pedagogy and people who are interested in money" *(C3R14S115)*. Interviewees at cases 5, 6 and 7 indicated that what was driving e-learning was not widening participation but exploration of new ways to enhance teaching and learning for existing students. Only in case 4 was there clear institutional strategy for e-learning: "Our objective is 100 percent buy-in on the part of lecturers; it is a very top-down approach here" *(C4R16S242)*. The case 4 strategy was two-pronged; on the one side to develop new markets using e-learning as a vehicle to deliver their degree courses overseas: "It's very much going to a different market, expanding our markets" *(C4R17S376)*; and on the other side, to enhance retention for existing students: "They obviously link it to ... a retention measure" *(C4R16S92)*.

There is also evidence that e-learning exploitation is counter to widening participation. Interviewee 3, a professor of education at case 1 where e-learning is implemented by relatively autonomous academic staff, states that "The kinds of students who come as full-time students to a campus-based university are not necessarily receptive to e-learning" *(C1R3S98)*, and at case 4 where e-learning is implemented as a top-down mandate interviewee 16 is doubtful about "effectiveness" *(C4R16S161)*.

The concept that e-learning exploitation is counter to widening participation is supported where students have limited access to ICT, and thus limited access to e-learning. The next section deals with research question 2: Are efforts being made to make information and communication technology (ICT) available to nontraditional students?

Making ICT Available to Nontraditional Students

Research question 2 asks: Are efforts being made to make information and communication technology (ICT) available to nontraditional students? There are two issues here: first, to make ICT physically available to students in a manner that supports the reduction of time and place barriers, which is part of the reason why e-learning is purported to aid widening participation; second, to make ICT skills available to traditionally excluded students who are from backgrounds where there is traditionally a lack of ICT skill.

Making ICT available in any form might support widening participation. Interviewee 6 at case 2 points out that e-learning cannot be implemented effectively without considering the "ICT infrastructure that supports e-learning" in

the university *(C2R6S733)*. The demand for access to computers on campus will necessarily increase if students are accessing more content online. Cases 1 and 2 have also instituted networked university residences, or resnets. However, for many universities only first-year students are provided with on-campus residences meaning that later years do not have access to res-nets; what is more, part of the case for e-learning as a widening participation tool is that it breaks down the time and place barriers of learning, enabling students with other responsibilities to access learning resources, thus students must be able to access e-learning off-campus as well as on-campus.

There is also the matter of students on work placement. Some of these students may have access to broadband ICT, but some are in smaller organisations where there is limited access available. One interviewee makes this point: "We are thinking about the distance learning component, for those students who are off on placement, the things that always gives us a great deal ... of worry, is we do not want to disadvantage those individuals who are off at companies that don't have access to high-speed Internet." *(C2R11S60)*. Finally there are those students whose degree courses are structured to be partly undertaken at work, such as nurses on some nursing degree courses, where there is also a need for ICT access at work.

There is evidence from one interviewee in case 5 that they are making ICT skills available to nontraditional students in a manner which supports widening participation for one particular school: "It is being able to fit it into their time; not having to go to particular locations, and so on. In the case of this school, it is also having arrangements for qualifying course, pre-registration courses in nursing and social work which are designed to fit in with their work" *(C5R19S218-224)*.

There is, however, rather more evidence of making ICT available in a way that does not mitigate the time and place barriers. One respondent in case 6 initially suggested that digital divide problems were countered by access to the "technology tower" *(C6R25S138)* on campus, which had excellent computer and online facilities, but is clearly only accessible on campus and is not available 24 hours a day, 365 days a year, and thus time and place access problems remain. Another respondent in case 6 had researched access to ICT in 2001 and found that only about half of her students had "access to a computer at home" *(C6R27S176)*. Yet another respondent in case 6 agreed that although he taught computer science there would still be some students who "might not even be able to afford to have a computer" *(C6R28S235)*. Another academic teaching computer science in case 6 had gathered statistics on students' access to computers at home, and although between 80 and 90 percent did "have a computer at home" *(C6R29S151 - 152)* this still leaves between 10 and 20 percent who did not.

Even if students have access to the technology, either on campus, on placement with computers and Internet access at their place of work, via resnets or campus network facilities, students from traditionally excluded groups may find that e-learning programmes are not designed in a manner that is accessible to them. Research question three addresses the design of e-learning programmes, and the next section deals with this area.

Is E-Learning Being Used with Suitable Pedagogy and Context?

Research question 3 asks: Are learning technologies being used with suitable pedagogy and e-learning context that make education accessible to potential nontraditional students? Recent research suggests that the use of e-learning drives new approaches to teaching and learning [Laurillard 1993; Sims et al. 2004a; Timmis 2003] which may be referred to as *e-pedagogy*. Such approaches may be beneficial to students from traditionally excluded groups and often feature skilled e-moderators who can help engage students in virtual learning contexts that support teaching and learning [Salmon 2000; Ward and Newlands 1998]. There is evidence of using new pedagogy from some interviewees in all but one of the cases. This section presents a cross-case analysis and some of the data from interviews.

Developing e-pedagogy appears to depend on an experimental approach to implementing e-learning. This could be due to the fact that the technologies are new, and there are few skills users of the technology, thus academics experiment, learn how to use it, and in doing so develop a new pedagogic approach. This view is identified by interviewee at case 3: "I guess that is a new skill; I'm sure it is a new skill and some people do it better than others and other people are writing books telling us how to do it so there is some development needed there." *(C3R13S225)* The cases using an experimental approach, and developing e-pedagogy, are presented in Table 3In case 5 interviewee 22 described the need to change how teaching and learning was planned, and pointed out that this was a difficult challenge: "The question of the pedagogy of a course is mentioned with increasing regularity now because we have such diverse media and what people want to do is to deliver certain components of the course via the most appropriate medium. We have to work out what kind of learning and teaching is best applied in what kind of medium. Those are hard questions to answer because nobody knows exactly what the answer is." *(C5R22S187).*

In case 5 interviewee 22 described the need to change how teaching and learning was planned, and pointed out that this was a difficult challenge: "The question of the pedagogy of a course is mentioned with increasing regularity now

because we have such diverse media and what people want to do is to deliver certain components of the course via the most appropriate medium. We have to work out what kind of learning and teaching is best applied in what kind of medium. Those are hard questions to answer because nobody knows exactly what the answer is." *(C5R22S187).*

Table 3. Use of Experimental Approach and Development of E-Pedagogy

Case	1	2	3	4	5	6	7
Experimentation	Yes	Yes	Yes in some departments	No	Yes	Yes	Yes
Developing e-pedagogy	Yes	Yes	Yes in some departments	No	Yes	Yes	Yes

Each of the cases commented on the use of new approaches to teaching and learning when using e-learning. Interviewee 12 in case 1 gave an example of the effectiveness of e-learning for students from traditionally excluded groups who are not as academically able as others: "[students] who are are not conventionally academically able, quite like to have things up, you know in an e-learning format, because [they can go] over and over to again at their own pace" *(C2R12S18)*. This was supported by interview 3 at case 1: "If you look at some of the effectiveness studies ... one ... classic is the TLTP Chemistry, where simply giving students a video of a lecture rather than a physical lecture, proved to be more effective in terms of conveying content, basically because students could do two things. They could view the video when they were receptive rather than having to be there at the time irrespective of whether they were in the right state to receive a lecture but also, if they hadn't fully understood something, they could replay it and it's quite an art taking good notes in real time as someone continues to speak and it's much easier to do that if you can stop the video, write something down and start the video again." *(C1R3S115)*. Interviewee 11 in case 2 supported this simple but effective aspect of e-learning: "so we wanted a way which was almost like somebody explaining it to them live, but that they could stop it and start it, it's something that the student has control of" *(C2R11S).*

In other statements interviewees discussed the development of e-pedagogy. In case 1, interviewee 2 said "The general thinking is yes, you have to rethink your teaching" *(C1R2S60)*. However, interviewee 3 pointed out that this was a new skill and that many academic staff were not skilled in developing new approaches to teaching and learning: "It is only recently that it has become the norm for anyone to have any training in actually how to teach in higher education ... If you then try to get them to adapt ... their use of technologies ... to fit a learning and teaching agenda, you are asking an awful lot of them" *(C1R3S69+71)*. This approach also helps to reduce time and, to a degree, place constraints, which is important for students from traditionally excluded groups: "[the students] enjoyed doing it at their own pace, and they didn't feel embarrassed about [it], because in the past if they had to review material they will have had to ask to review the video in front of their colleagues and so on, now they could just watch the stuff ... anywhere on-campus, any time, even on the res-net connected rooms." *(C2R11S35)*.

Interviewee 13 from case 3 suggested that while it is important to develop a new pedagogic approach, it is also difficult: "The technology is the easy part. The really difficult bit is changing the pedagogy … what motivates the students … operating in an asynchronous way … is putting more responsibility on the student … to be successful, for a more problem solving approach to learning than perhaps has traditionally been the case." *(C3R13S73-74)*. Interviewee 19 in case 5 also identified developing new approaches to teaching and learning: "I would say it is still really being developed. I think the challenge to us using e-learning … and … our thinking about interactive learning … needs to change and in many ways get a bit more sophisticated." *(C5R19S299)*.

Finally, to hear from cases 6 and 7, interviewee 29 from case 6 said "Is there something different in an e-learning style of pedagogy then I would say probably yes" *(C6R29S77)*, and interviewee 30 from case 7 said, "You have to be the sort of lecturer who is willing to examine their own teaching and learning in order to make it work because it does require a different way of thinking" *(C7R30S120)*.

However, the development of e-pedagogy was not uniform, and while many identified that it was needed, whether or not it was working is another proposition. Interviewee 3 from case 1 questioned whether or not e-pedagogy was being developed well: "I have yet to see evidence of the fact that people are as yet very good at social construction of knowledge in an on-line environment, even though it is theoretically possible it doesn't seem to happen very much." *(C1R3S60)*. E-pedagogy did not appear to be being developed in case 4. Interviewee 16 from case 4, who is one of the lecturers chosen to implement e-learning in face-to-face teaching and learning as well as developing modules for the distance learning courses, discussed how he did not change his delivery for e-learning: "No, none of those things; none of the more advanced possibilities; none of that. I have used the content areas and have occasionally sent an e-mail which the students singularly fail to pick up (laughs). They don't access their university e-mail, like other things I guess" *(C4R16S127)*. Case 2 also had e-learning being used with little thought or redesign of approach, as identified by interviewee 7: "One of the problems we've got is that people think that if they can put all

their teaching content on to Blackboard that that is e-learning, all you've done is you transferred your material from one location to another" *(C2R7S38)*, as did cases 5 and 6. In case 5 the interviewer asked, "Has that meant a redesign of the path students take through the material?" to which interviewee 20 replied: "On the whole, not." (C5R20S34). In case 6 interviewee 28 said "In terms of actually designing the course I think, no" *(C6R28S41)*.

In answering the first of the questions posed by this research, the data is unclear as to whether the intention is to use learning technology to widen participation to those members of society who have previously been excluded from participation in higher education. Since the use of learning technology is often acquired and funded centrally, and this research did not have access to the original decision process regarding technology acquisition, it is unable to draw a conclusion about intent of acquisition. However, those using the technology do so largely for pedagogical reasons, none for reasons of widening participation. Where widening participation is a consideration, it results in a reduced motivation to use learning technologies, not in an increased motivation, as a result of concerns by academics about unequal student access to ICT, thus the use of learning technology is perceived by some academics as a barrier to widening participation rather than a means of lowering barriers.

The answer to the second question is largely negative; institutions are not making an effort to ensure that disadvantaged students are provided with the technology required to access online learning resources and activities on VLEs. Although some students are provided with technology, if they are assessed as having learning difficulties, those students who have financial, cultural, or other disadvantages are not provided with computers and Internet access at home. Given the mission of widening participation espoused by government and HEIs, and the central role that e-learning is purported to play, there appears to be dissonance between government and institutional beliefs and intentions, and the reality of implementation.

The third question asks: Is learning technology used in a pedagogical manner that that is accessible to nontraditional students? The data collected from this study suggests that decisions about online pedagogy are not based on widening participation, but rather on enriching teaching and learning for those students who already have access to technology. For nontraditional students, with low income and low-terminal education levels, provision of ICT is not sufficient. E-learning must be used with a suitable pedagogy and efforts need to be made to create a social context for learning. Unfortunately, there is no evidence from the cases that this is happening.

VIII. CONCLUSION

With the advent of learning technologies and the use of VLEs, online access to learning is an important issue for campus-based universities engaging in F2F and distance teaching and learning, as well as distance learning institutions. Not only is access to a computer and the Internet on campus an issue, but many students are expected to have access to computers and the Internet at home, or in the work place when on placement, in order to access VLEs. But, the digital divide has moved beyond mere access to computers and the Internet—large file sizes and the use of interactive e-learning mean that access to broadband is also of growing importance.

Although national governments and the EU place a high importance on widening participation in education, and universities (the traditional seat of higher education), none of the universities studied in this research had programmes for bridging the digital divide. None provided hardware or online access for student use in homes beyond the campus res-net. None took steps to ensure that file-size and interactivity was compatible with non-broadband transmission. Charitable organizations are working to provide recycled computers that businesses would otherwise pay to dispose of to low income households. If this type of initiative is combined with community wireless networks (WiFi) then it is possible for cheap (or possibly free) broadband access to the Internet to be achieved.

Some of the respondents believed that access to computing facilities on campus was a sufficient measure to overcome lack of access at home. However, the lowering of time and place barriers is an important aspect of including nontraditional students in higher education, and if students have to travel to campus in order to use computing facilities the place barrier is not lowered, and if facilities are not open 24/7 then the time barriers are not lowered either. However, this does not address the larger issue of establishing an e-learning context. Supplying ICT to low income households with low-terminal education levels will not be sufficient. Social infrastructure, such as learning networks, communities of practice, and HEI outreach workers, are likely to be needed if e-learning is to be successful and widened participation achieved. However, none of the cases considered cultural, ethnic, or gender issues in the use of learning technology. Despite this, respondents in five of the seven cases believed the digital divide to be a particular problem.

This study must conclude that, without particular measures to overcome the digital divide, current practices in higher education can only reinforce socioeconomic, cultural, ethnic and gender divides in access to higher education. Cognitive dissonance theory leads to a belief that for the current dissonant practices to end, the reality of e-learning and the digital divide must be made public and the more inescapable the message the higher the motivation for

government and HEIs to achieve consonance through addressing the problems of access to learning for excluded populations.

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Communications of the Association for Information Systems

ISSN: 1529-3181

Communications of the Association for Information Systems